EXPLORING THE EFFICACY OF ADAPTIVE SAFETY FOR SOCIAL SUSTAINABILITY IN CONSTRUCTION SUPPLY CHAIN MANAGEMENT

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ABSTRACT

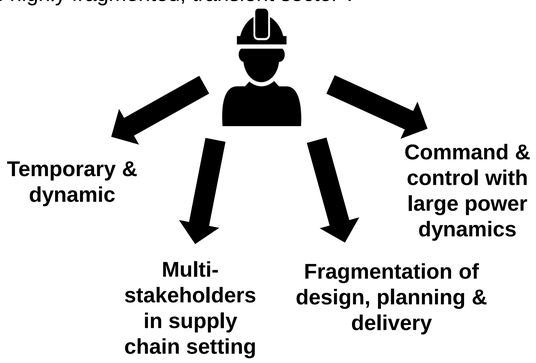
The integration of resilience engineering principles and adaptive safety to various high risk and ultra-safe industries is gaining pace. In contrast to these industries, the Construction Sector relies on temporary, dynamic and multi-stakeholder networks within a supply chain setting. This research being undertaken as part of PhD study aims to explore the efficacy of applying adaptive safety theory to construction supply chain management and the alignment of this theory to social sustainability principles at supply chain level.

BACKGROUND

There is recent industry evidence that some UK construction companies are turning away from 'zero accident vision', and the traditional foundation of compliance it embodies, to explore the potential for resilience through adaptive safety. The alternative lens from which to consider organisational practices offered by the adaptive age of safety[1] is argued to transcend traditional safety management. The orientation towards acceptance of adaptive capabilities refocuses the view of workers as a source of innovation and a solution to empower motivated safety performance[2]. It is centred on the 'messy' reality of work with variable demands, resources and trade-offs[3]. It questions faith in prescribed systems and facilitates understanding of the acts of workers. A focus on examination of normal work, with its blurred lines between facilitating productivity and safety makes this new view a strategically attractive prospect for organisations in optimising safety management and reducing bureaucracy.

PROBLEM STATEMENT

Approaches to addressing adaptive safety require mechanisms for anticipating, monitoring, responding and learning about and from challenges in an effective manner. This requires engagement and commitment underpinned by a just culture and safety leadership across the construction supply chain[4]. This can be challenging in this highly fragmented, transient sector[5].



The alignment of adaptive safety theory to social sustainability principles including equity, justice, wellbeing and social opportunity for construction industry workers provides a basis from which to evaluate adaptive safety theory in the light of moving the sustainability debate forward and placing human needs at its core in the world of work. Assessing efficacy of this change is the focus of this work.

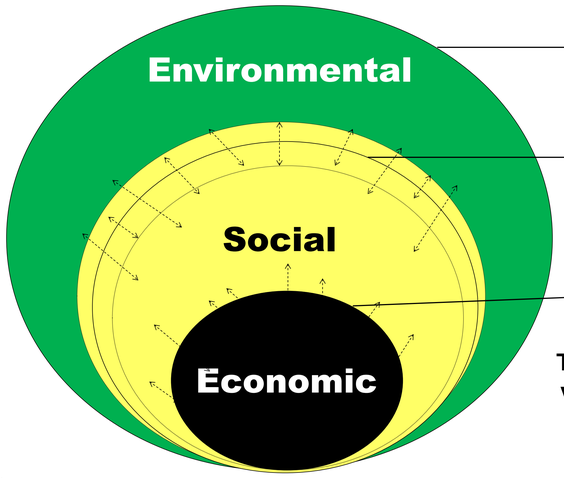
RESEARCH AIMS & OBJECTIVES

The overall aim is to explore the efficacy of applying adaptive safety theory to the occupational health and safety (OHS) management of construction supply chains and the alignment of this theory to social sustainability principles. To achieve this there are four objectives, which are to:

1. Evaluate construction supply chain OHS management using the lens of social sustainability and adaptive safety theory in order to examine factors that contribute to successful (and safe) work delivery.
2. Explore current practice and perceptions within the construction industry towards adaptive safety.
3. Evaluate the application of adaptive safety theory, construction supply chain dynamics and successful (and safe) construction project outcomes in selected organisations.
4. Develop a model of adaptive safety for sustainable supply chain strategies to influence worker safety.

The proposed outcome looks to influence better safety management of construction supply chains, and embedded alignment of worker safety practices within the domain of sustainability.

The Nested Circles Model of Sustainability[6]



Ecological Carrying Capacity. Ecological limits. Natural Resource Constraints. Ecosystem Services Provision

Governance. Society. Community. Work. Values driven to maintain social capital and ensure equity, wellbeing and justice inter – and intra- generationally

Economic Activity. Organisational Profits. Income. Economic Welfare.

The model places adaptive safety within a wider view of sustainability to support social value of work, equity, wellbeing and justice in construction supply chain management.

RESEARCH DESIGN

Phase 1: Exploratory Case Study (Theory Construction)- A single organisation was studied through an exploratory case study protocol following Yin[7] to evaluate a novel re-orientation of this organisation from a zero accident ethos to worker-centric safety. A social constructivist approach was taken with manager and worker interviews, together with review of policies, strategies and records in order to evaluate the experience and practices of this change. Systematic combining grounded in abductive logic following Dubois and Gadde[8] was undertaken allowing switching between empirical data and theory allowing greater understanding of the phenomena under study.

Phase 2: Construction industry survey - Following conceptual framework development a construction industry survey was prepared utilising an initial stakeholder review and pilot survey. This survey is currently being undertaken in construction industry. The outcome will provide clarity on the industry orientation towards the new view of safety; the view and treatment of construction workers, and the potential for resilience based on existing practices.

Phase 3: Construction industry case studies/action research - Organisation level case studies representing varying procurement and supply chain characteristics will be carried out to evaluate in-depth the opportunities and barriers to empowering adaptive safety based on institutional logics between organisations and associated project contexts including demands, resources and pressures. Potential opportunities currently under investigation include the possibility of undertaking a knowledge transfer partnership (KTP) to become embedded within a specific organisation to undertake action research

PROVISIONAL RESULTS

Construction industry safety practices today

PHASE 1 RESULTS – CHARACTERISTICS OF OLD AND NEW SAFETY APPROACHES IN AN EXPLORATORY CASE STUDY (SINGLE COMPANY)

The Old	The New
• Zero Accident Mission Strategy • Lack of anticipation as operations evolved • Trade-offs favouring efficiency and cost • Transactional leadership • Financial reward for zero accident targets • A focus and response to minor and major risks • Fear and lack of reporting • Low communication • Department Silos • Punitive Culture • Mistrust and Blame prevalent within and between departments and hierarchy • Counterfactual reasoning in accident reviews • Paperwork & Checklist SMS system • Large dependence on toolbox talks training with sign-off • Top-down bureaucratic response to incidents with additional rules, procedures and training	• Adaptive Safety Strategy • Anticipatory processes for daily planning and change management with diverse attendance. • Transformational leadership • Focus on severe and fatal risks • Positive investigation of normal work. • Appreciative enquiry to probe governing influences around the experience of work and culture. • WAI/WAD evaluations • High levels of communication • Relationship-building and worker engagement activity • Ongoing reduction activity for SMS paperwork • Focus on process not people in managing safety • Open and responsive culture. • Shared responsibility bottom-up

REFERENCES

1. Borys, D., Else, D., & Leggett, S. (2009). The fifth age of safety: The adaptive age? Journal of Health and Safety Research and Practice, 1(1), 19–27
2. Dekker S. W. (2014b). Safety differently: Human factors for a new era. Boca Raton, FL: CRC Press
3. Hollnagel, E. (2009). The ETTO principle: Efficiency-Thoroughness Trade-Off. Why things that go right sometimes go wrong. Farnham, UK: Ashgate.
4. Hollnagel, E. Pariès, J. Woods, D. D. & Wreathall, J. (Eds) (2011). Resilience Engineering Perspectives Volume 3: Resilience Engineering in Practice. Farnham, UK: Ashgate
5. Holmes, N., Lingard, H., Yesilyurt, Z., & De Munk, F. (1999). An exploratory study of meanings of risk control for long term and acute effect occupational health and safety risks in small business construction firm. Journal of Safety Research, 30(4), 251-261.
6. Giddings, B.; Hopwood, B.; O'Brien, G. (2001) Environment, economy and society: Fitting them together into sustainable development. Sustain. Dev. 10 (4) 187–196.
7. Yin, R. K. (2009). Case study research: Design and methods (4th Ed.). Thousand Oaks, CA: Sage
8. Dubois, A., Gadde, E. (2002) Systematic combining: an abductive approach to case research. Journal of Business Research 55 (7) 553– 560